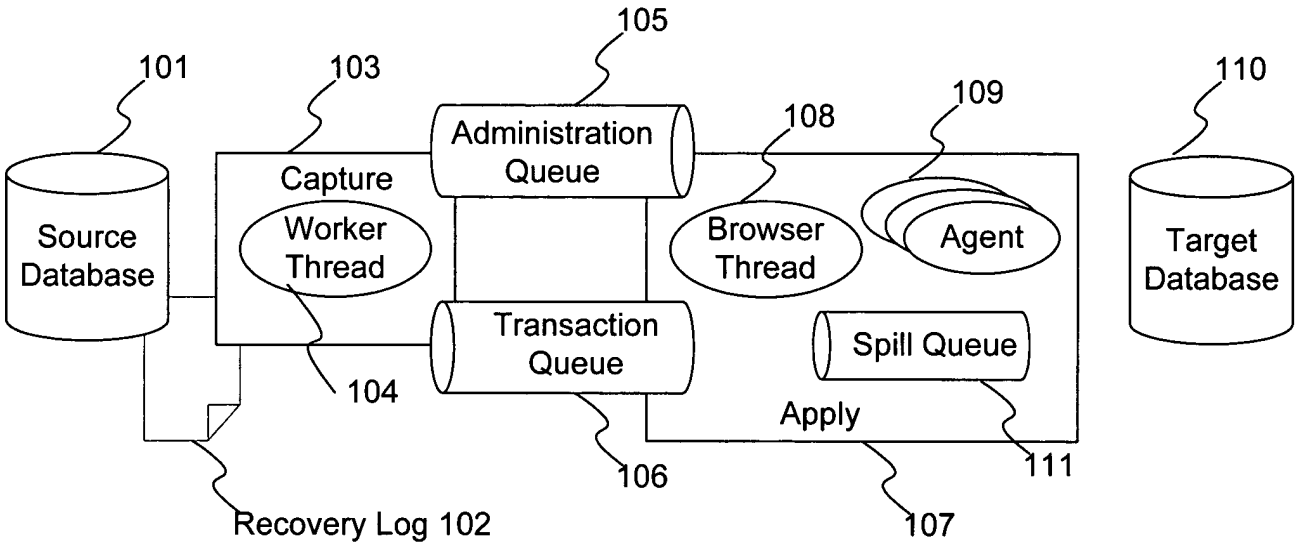
105
101
103
110
109
108
Administration Queue
Capture
Source Database
Worker Thread
Browser Thread
Agent
Target Database
Transaction Queue
Spill Queue
104
Apply
106
111
Recovery Log 102
107

FIG. 1

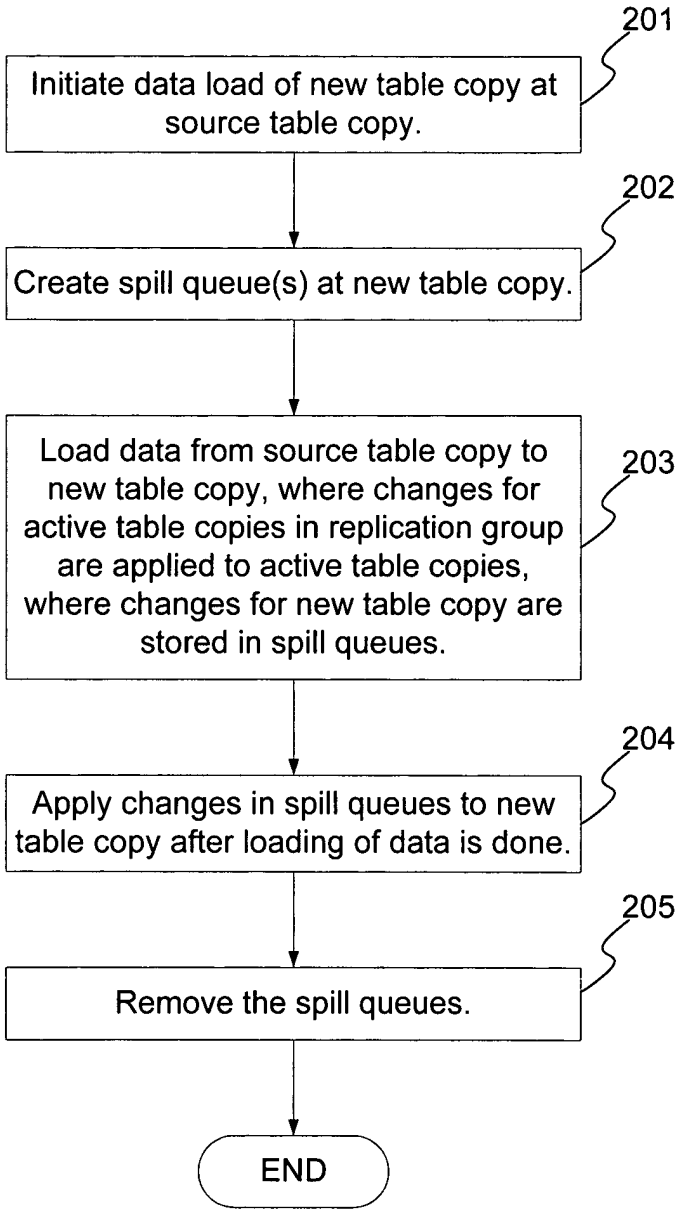
201
Initiate data load of new table copy at source table copy.
202
Create spill queue(s) at new table copy.
203
Load data from source table copy to new table copy, where changes for active table copies in replication group are applied to active table copies, where changes for new table copy are stored in spill queues.
204
Apply changes in spill queues to new table copy after loading of data is done.
205
Remove the spill queues.
END

FIG. 2

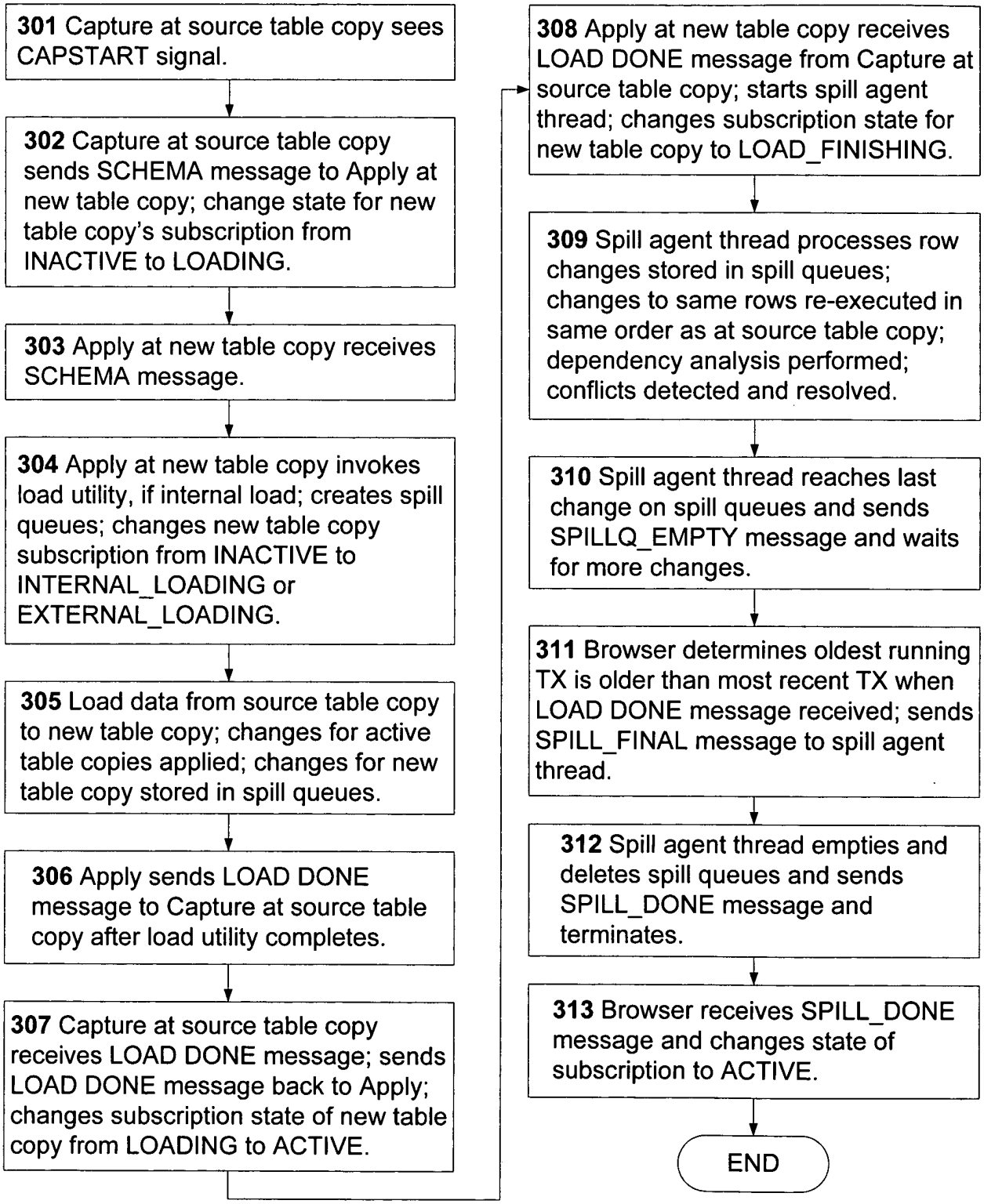
301 Capture at source table copy sees CAPSTART signal.
302 Capture at source table copy sends SCHEMA message to Apply at new table copy; change state for new table copy's subscription from INACTIVE to LOADING.
303 Apply at new table copy receives SCHEMA message.
304 Apply at new table copy invokes load utility, if internal load; creates spill queues; changes new table copy subscription from INACTIVE to INTERNAL_LOADING or EXTERNAL_LOADING.
305 Load data from source table copy to new table copy; changes for active table copies applied; changes for new table copy stored in spill queues.
306 Apply sends LOAD DONE message to Capture at source table copy after load utility completes.
307 Capture at source table copy receives LOAD DONE message; sends LOAD DONE message back to Apply; changes subscription state of new table copy from LOADING to ACTIVE.
308 Apply at new table copy receives LOAD DONE message from Capture at source table copy; starts spill agent thread; changes subscription state for new table copy to LOAD_FINISHING.
309 Spill agent thread processes row changes stored in spill queues; changes to same rows re-executed in same order as at source table copy; dependency analysis performed; conflicts detected and resolved.
310 Spill agent thread reaches last change on spill queues and sends SPILLQ_EMPTY message and waits for more changes.
311 Browser determines oldest running TX is older than most recent TX when LOAD DONE message received; sends SPILL_FINAL message to spill agent thread.
312 Spill agent thread empties and deletes spill queues and sends SPILL_DONE message and terminates.
313 Browser receives SPILL_DONE message and changes state of subscription to ACTIVE.
END

FIG. 3

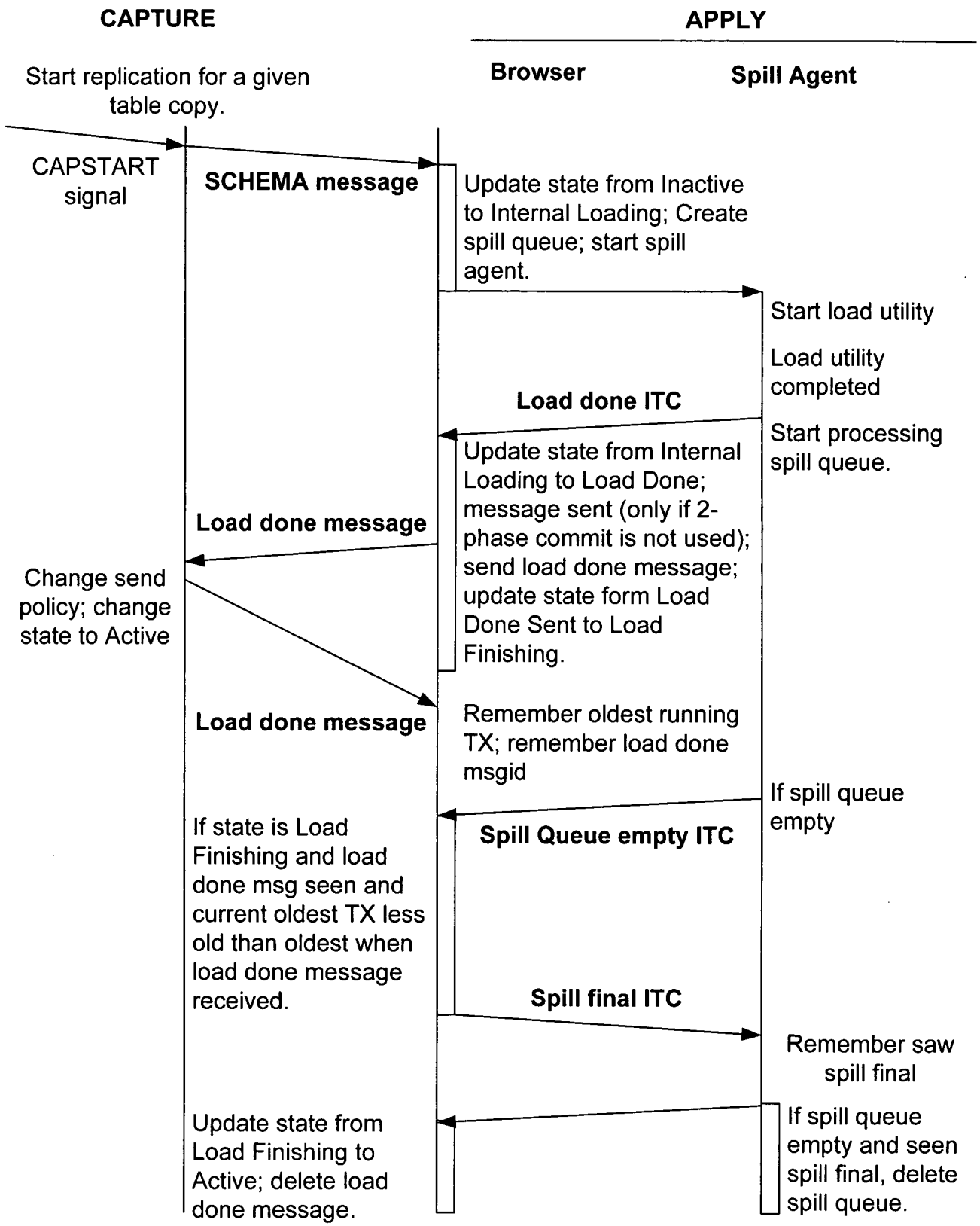
CAPTURE
APPLY
Browser
Spill Agent
Start replication for a given table copy.
CAPSTART signal
SCHEMA message
Update state from Inactive to Internal Loading; Create spill queue; start spill agent.
Start load utility
Load utility completed
Load done ITC
Start processing spill queue.
Update state from Internal Loading to Load Done; message sent (only if 2-phase commit is not used); send load done message; update state form Load Done Sent to Load Finishing.
Load done message
Change send policy; change state to Active
Load done message
Remember oldest running TX; remember load done msgid
If spill queue empty
Spill Queue empty ITC
If state is Load Finishing and load done msg seen and current oldest TX less old than oldest when load done message received.
Spill final ITC
Remember saw spill final
Update state from Load Finishing to Active; delete load done message.
If spill queue empty and seen spill final, delete spill queue.

FIG. 4

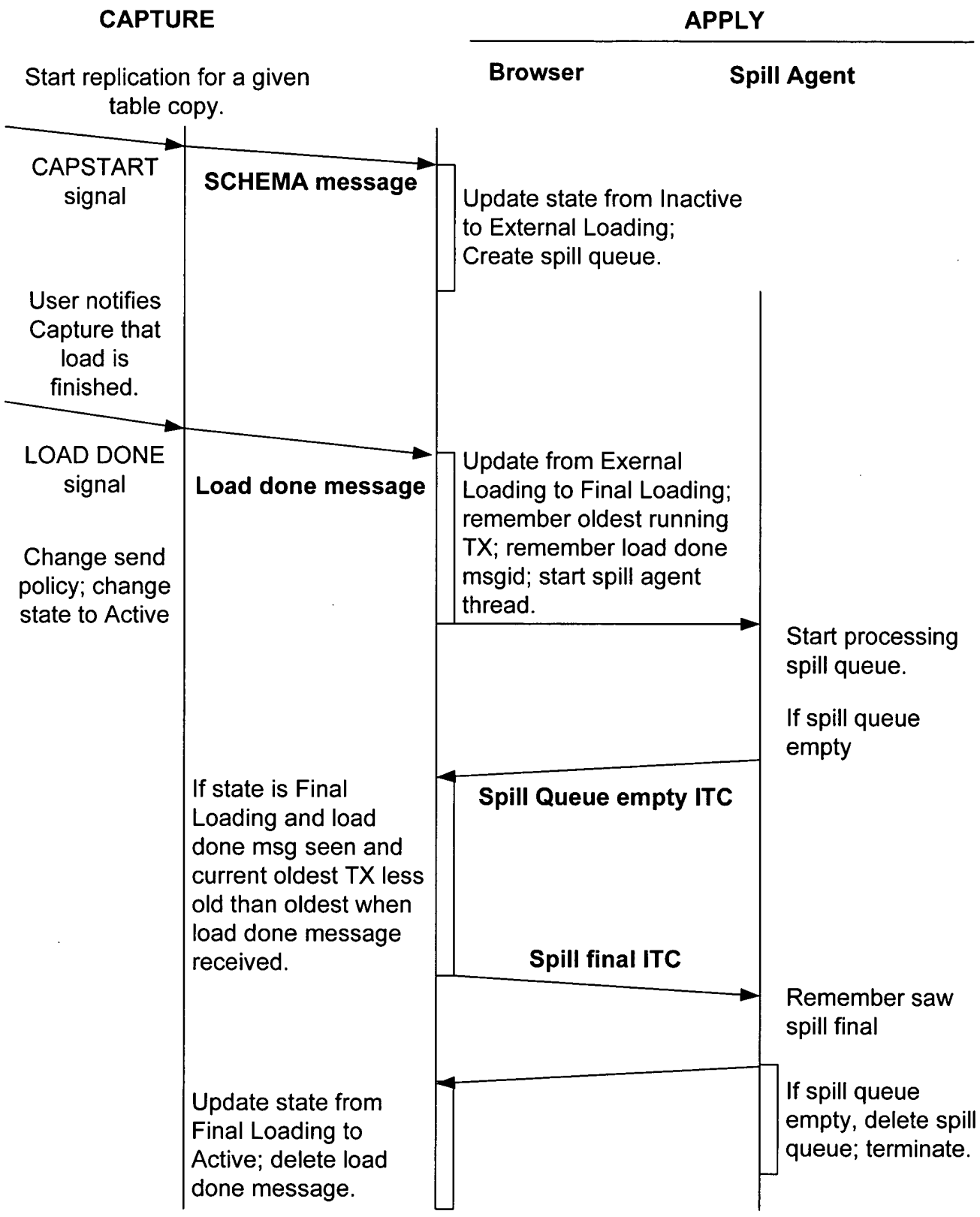
CAPTURE
APPLY
Browser
Spill Agent
Start replication for a given table copy.
CAPSTART signal
SCHEMA message
Update state from Inactive to External Loading; Create spill queue.
User notifies Capture that load is finished.
LOAD DONE signal
Load done message
Update from Exernal Loading to Final Loading; remember oldest running TX; remember load done msgid; start spill agent thread.
Change send policy; change state to Active
Start processing spill queue.
If spill queue empty
Spill Queue empty ITC
If state is Final Loading and load done msg seen and current oldest TX less old than oldest when load done message received.
Spill final ITC
Remember saw spill final
If spill queue empty, delete spill queue; terminate.
Update state from Final Loading to Active; delete load done message.

FIG. 5